

1 **CLAIMS**

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3 1. A processor-readable medium comprising processor-executable  
4 instructions configured for:

5 identifying instructions executing on a processor;  
6 receiving power consumption data from a power measurement circuit; and  
7 correlating the power consumption data with the identified instructions.

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9 2. A processor-readable medium as recited in claim 1, wherein the  
10 identifying comprises:

11 interrupting the processor;  
12 sampling a program counter of the processor;  
13 scanning a lookup table to find an address indicated by the program  
14 counter; and  
15 determining an instruction located at the address.

16  
17 3. A processor-readable medium as recited in claim 1, wherein the  
18 receiving comprises:

19 querying the power measurement circuit; and  
20 receiving digital power readings from the power measurement circuit based  
21 on the querying.

22  
23 4. A processor-readable medium as recited in claim 1, wherein the  
24 receiving comprises receiving digital power readings from the power measurement  
25 circuit at preset time intervals.

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2       5.     A processor-readable medium as recited in claim 1, wherein the  
3 correlating comprises associating with an identified instruction, a measured  
4 amount of power consumed during execution of the identified instruction on the  
5 processor.

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7       6.     A processor-readable medium as recited in claim 1, wherein the  
8 correlating comprises generating a power profile that includes a plurality of power  
9 consumption values and a plurality of identified instructions, wherein each power  
10 consumption value is associated with an identified instruction in the power profile.

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12       7.     A processor-readable medium as recited in claim 6, wherein the  
13 power profile is selected from the group comprising:

14         a table having pairs of data, each pair of data comprising a power  
15 consumption value and an identified instruction; and

16         a graph correlating power consumption values with identified instructions.

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18       8.     A processor-readable medium as recited in claim 1, wherein the  
19 power consumption data comprises power consumption values measured during  
20 execution of the instructions on the processor.

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22       9.     A processor-readable medium as recited in claim 1, wherein the  
23 processor is a component of a device selected from the group comprising:

24         an embedded mobile PDA (personal digital assistant) computing device  
25 operable by battery power;

1 a cell phone;  
2 a smart phone;  
3 a notebook computer;  
4 a desktop PC (personal computer);  
5 a workstation;  
6 a server;  
7 a mainframe computer; and  
8 an Internet appliance.

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10 **10.** A processor-readable medium comprising processor-executable  
11 instructions configured for associating a software instruction with an amount of  
12 power consumed by executing the software instruction.

13  
14 **11.** A processor-readable medium as recited in claim 10, wherein the  
15 associating comprises generating a power profile that matches software  
16 instructions executing on an embedded device with corresponding power  
17 consumption values measured during execution of the software instructions.

18  
19 **12.** A processor-readable medium comprising processor-executable  
20 instructions configured for:

21 measuring power consumption of software instructions executing on a  
22 target computing device;

23 converting analog power measurements into digital power measurements;

24 and

25 transmitting the digital power measurements to a host computer.

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2       13.    A processor-readable medium as recited in claim 12, comprising  
3 further processor-executable instructions configured for storing the digital power  
4 measurements in a memory after the converting.

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6       14.    A processor-readable medium as recited in claim 12, wherein the  
7 transmitting comprises:

8       receiving a request for the digital power measurements from the host  
9 computer; and

10       transmitting the digital power measurements to the host computer based on  
11 the request.

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13       15.    A processor-readable medium as recited in claim 12, wherein the  
14 transmitting comprises transmitting the digital power measurements to the host  
15 computer at preset time intervals.

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17       16.    A processor-readable medium as recited in claim 12, wherein the  
18 target computing device is selected from a group comprising:

19       an embedded mobile PDA (personal digital assistant);

20       a cell phone;

21       a smart phone;

22       a notebook computer;

23       a desktop PC (personal computer);

24       a workstation;

25       a server;

1 a mainframe computer; and  
2 an Internet appliance.

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4 **17.** A method comprising generating a power profile that associates a  
5 software instruction with an amount of power consumed during execution of the  
6 software instruction.

7  
8 **18.** A method as recited in claim 17, wherein the execution of the  
9 software instruction is performed by a processor on a target computing device and  
10 the amount of power consumed is an amount of power consumed by the processor.

11  
12 **19.** A method as recited in claim 17, wherein the generating comprises:  
13 identifying the software instruction executing on a processor;  
14 receiving power consumption data from a power measurement circuit; and  
15 correlating the power consumption data with the identified software  
16 instruction.

17  
18 **20.** A computer comprising a power profiler configured to identify  
19 software instructions executing on a processor, receive power consumption data,  
20 and correlate the power consumption data with the software instructions such that  
21 each software instruction is associated with a power consumption value indicating  
22 an amount of power consumed during the executing of the software instruction.

23  
24 **21.** A computer as recited in claim 20, further comprising a lookup table,  
25 the power profiler further configured to monitor a program counter on the

1 processor and to identify the software instructions through the lookup table based  
2 on the program counter.

3  
4 **22.** A computer as recited in claim 20, further comprising a power  
5 profile having a plurality of power consumption values each paired with a  
6 corresponding software instruction to indicate an amount of power consumed  
7 during execution of the corresponding software instruction.

8  
9 **23.** A computer comprising a power profiler configured to generate a  
10 power profile that correlates software instructions with power consumed during  
11 execution of the software instructions.

12  
13 **24.** A computer comprising:  
14 means for identifying instructions executing on a processor;  
15 means for receiving power consumption data from a power measurement  
16 circuit; and  
17 means for generating a power profile that correlates the power consumption  
18 data with the identified instructions.

19  
20 **25.** A computer as recited in claim 24, wherein the means for identifying  
21 instructions comprises:  
22 means for interrupting the processor;  
23 means for sampling a program counter of the processor; and  
24 means for determining an instruction based on the program counter.  
25

1           **26.**    A computer as recited in claim 24, wherein the means for receiving  
2 comprises:

3                   means for querying the power measurement circuit; and  
4                   means for receiving digital power readings from the power measurement  
5 circuit based on the querying.

6  
7           **27.**    A power measurement circuit comprising:  
8                   means for measuring power consumption of software instructions executing  
9 on an embedded device;

10                   means for converting analog power measurements into digital power  
11 measurements; and

12                   means for transmitting the digital power measurements to a host computer  
13 in response to a query from the host computer.

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15           **28.**    A power measurement circuit as recited in claim 27, further  
16 comprising means for storing the digital power measurements.

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18           **29.**    A computer comprising:  
19                   a processor;  
20                   instructions stored in a memory and executable on the processor; and  
21                   a power measurement circuit configured to measure power consumed by the  
22 processor during execution of each instruction.

1           30. A computer as recited in claim 29, further comprising an analog to  
2 digital converter integrated as part of the power measurement circuit and  
3 configured to convert analog power signals to digital power consumption data.

4  
5           31. The computer of claim 29 implemented as a device selected from the  
6 group comprising:

7           an embedded mobile PDA (personal digital assistant);

8           a cell phone;

9           a smart phone;

10          a notebook computer;

11          a desktop PC (personal computer);

12          a workstation;

13          a server;

14          a mainframe computer; and

15          an Internet appliance.

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17          32. A system comprising:

18          a power profiler configured to correlate an identified software instruction  
19 with an amount of power consumed during execution of the identified software  
20 instruction;

21          a lookup table having information for identifying the identified software  
22 instruction; and

23          a power profile generated by the power profiler and having power  
24 consumption values and identified software instructions, each power consumption  
25 value paired with a corresponding identified software instruction.



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**33.** A system as recited in claim 32, further comprising:

a power measurement circuit configured to measure the amount of power consumed during execution of the identified software instruction; and  
an analog to digital converter configured as part of the power measurement circuit to convert analog power consumption measurements into digital power consumption data.

**34.** A system as recited in claim 33, wherein the power measurement circuit is a component of a target computing device on which the identified software instruction is executed.